REMARKS

The Office Action issued May 9, 2001 has been reviewed and the comments of the U.S. Patent and Trademark Office have been considered. Claims 1 and 5 have been canceled. Claims 2 and 6-8 have been amended. No new matter has been entered. Accordingly, Applicant requests reconsideration of the pending claims 2-4 and 6-8.

Applicants thank the Examiner for the courtesy extended to Applicants' representative during a telephone interview on August 7, 2001. It was agreed during the telephone interview that Applicants would submit an amendment to the claims that would more particularly point and distinctly claim the invention, and in particular, the orientation of the tool during grinding of the sealing portion.

The drawings have been objected to for failing to show a grinding tool that forms the sealing portion 612. Applicants propose to show a dashed outline of a tool in the attached proposed drawing correction. Support for this proposed change to the drawing is described in originally filed specification, for example, at pages 8 and 9. Additionally, Figure 1 has been objected to as being unclear as to the element being referenced by numeral 78. Applicants respectfully note that element 78 points to a swirl disk that is more particularly shown in Figure 2. Accordingly, this objection to the drawings should be withdrawn.

The specification has been objected to due to informalities noted in the Office Action. Applicants have amended the specification, as suggested by the Examiner. Accordingly, this objection the specification should also be withdrawn.

Claims 8-10 have been objected as lacking antecedent basis in the specification. Applicants have amended the specification as suggested by the Examiner. Support for this amendment can be found in the originally filed specification, for example, in claims 8-10. Accordingly, this objection should also be withdrawn.

Claims 1, 2 and 5 stand rejected under 35 U.S.C.§102(b) as being anticipated by JP60-019957 ("Yuji"). Claims 1 and 2 stand rejected under 35 U.S.C.§102(b) as being anticipated by GB2029508 ("Claxton"). Claims 3-4 stand rejected under 35 U.S.C. §103(a) as being

unpatentable over either Yuji or Claxton. Claims 5-10 stand rejected under 35 U.S.C. §103(a) as being unpatentable over Yuji or Claxton in view of GB 2151516 ("Sasao").

Insofar as the rejection can be applied to amended claim 7, Applicants respectfully traverse this rejection because neither Yuji, Claxton nor Sasao teaches or suggests the claimed invention as a whole as recited by amended claim 7. In particular, Claim 7 recites a method of forming a fuel injector seat that is achieved by a sequence of actions that can be performed in varying order. Claim 7 recites forming an orifice portion with a first transverse cross-sectional area, forming a sealing portion with a second cross-sectional area that decreases from a first area to a second area, determining a ratio of the first transverse cross-sectional area over the first area, and forming a transition when the ratio exceeds a predetermined value, the forming includes grinding with a tool that has a conical end with a vertex of the conical end disposed in a volume provided by the transition portion.

In contrast, Yuji states, in the attached English Abstract, that a coupling surface 15 is provided between the seat surface 13 and the injection hole 14 so that when lapping operation is carried out for the injection hole 14, no burr is formed on the injection hole 14. Claxton, as stated on column 3, is concerned with maintaining flow between area B of the valve tip 122 and the exit orifice 132. Claxton is silent as to how the valve seat surface 126 is formed. As recognized in the Office Action, neither Yuji nor Claxton teaches nor suggests a tool to provide a selected finish on either the valve seat surface 13 of Yuji or the valve seat 126 of Claxton. Moreover, both are silent as to when to form a transition portion. Notwithstanding the deficiency recognized in the Office Action, Sasao is relied upon, without adequate motivation, to modify either Yuji or Claxton to provide for a tool that can form a select finish on the valve seat of either Yuji or Claxton. However, the proposed combinations fail to teach the claimed invention because Sasao uses a burnishing tool 17 to form seat surface 10a with a truncated cone surface 17b that remains outside a portion (unlabeled in Figure 4 of Sasao) adjacent to the discharge port 11, and does not use a tool that has a conical end with a vertex of the conical end disposed in a volume provided by the transition portion, as recited in amended claim 7. Thus, the proposed combinations fail to suggest or teach all features of the invention as a whole, as recited in claim 7.

Thus, neither Yuji, Claxton nor Sasao provides the suggestion to modify Yuji or Claxton as proposed. Accordingly, the rejection to claim 7 should be withdrawn, because the claimed invention, as a whole, recites features not taught by Yuji, Claxton or Sasao, singularly or in combination.

Claims 2-4, 6 and 8-10 depend ultimately from independent claim 7, are therefore also allowable for at least the same reason as claim 7, as well for reciting additional features.

CONCLUSION

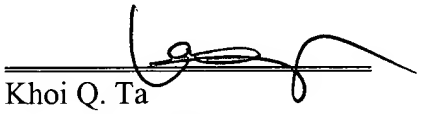
In view of the foregoing amendments and remarks, Applicant respectfully requests the reconsideration and reexamination of this application and allowance of the pending claims 1-18. Applicant respectfully invites the Examiner to contact the undersigned at **(202) 467- 7203** if there are any outstanding issues that can be resolved via a telephone conference.

Attached hereto is a marked-up version of the changes made to the specification and claims by the current amendment. The attached pages are captioned "**VERSION WITH MARKINGS TO SHOW CHANGES MADE.**"

EXCEPT for issue fees payable under 37 C.F.R. §1.18, the Commissioner is hereby authorized by this paper to charge any additional fees during the entire pendency of this application including fees due under 37 C.F.R. §§1.16 and 1.17 which may be required, including any required extension of time fees, or credit any overpayment to Deposit Account No. 50-0310. This paragraph is intended to be a **CONSTRUCTIVE PETITION FOR EXTENSION OF TIME** in accordance with 37 C.F.R. §1.136(a)(3).

Respectfully submitted,

MORGAN, LEWIS & BOCKIUS LLP



Khoi Q. Ta
Reg. No. 47,300

Date: August 9, 2001
MORGAN, LEWIS & BOCKIUS LLP
1800 M Street, N.W.
Washington, D.C. 20036
(202) 467-7000
Customer No. 009629

VERSION SHOWING MARKED UP CHANGES

IN THE SPECIFICATION:

Paragraph on page 4, starting on line 17 has been amended as follows:

-- ~~[a]~~ **A** fuel inlet member 24 with an inlet passage 26 is disposed within the overmolded plastic member 20. The inlet passage 26 serves as part of the fuel passageway 16 of the fuel injector assembly 10. ~~[a]~~ **A** fuel filter 28 and an adjustable tube 30 are provided in the inlet passage 26. The adjustable tube 30 is positionable along the longitudinal axis 18 before being secured in place, thereby varying the length of an armature bias spring 32. In combination with other factors, the length of the spring 32, and hence the bias force against the armature, control the quantity of fuel flow through the injector. The overmolded plastic member 20 also supports a socket 20a that receives a plug (not shown) to operatively connect the fuel injector assembly 10 to an external source of electrical potential, such as an electronic control unit (not shown). An elastomeric O-ring 34 is provided in a groove on an exterior of the inlet member 24. The O-ring 34 is supported by a backing ring 38 to sealingly secure the inlet member 24 to a fuel supply member (not shown), such as a fuel rail.--

Paragraph on page 5, starting on line 8 has been amended as follows:

-- The spacer 48 engages the body shell 50, which engages the body 52. An armature guide eyelet 56 is located on an inlet portion 60 of the body 52. An axially extending body passage 58 connects the inlet portion 60 of the body 52 with an outlet portion 62 of the body 52. The armature passage 54 of the armature 46 is in fluid communication with the body passage 58 of the body 52. ~~[a]~~ **A** seat 64, which is preferably a metallic material, is mounted at the outlet portion 62 of the body 52.--

VERSION SHOWING MARKED UP CHANGES

Paragraph on page 8, starting on line 4, has been amended as follows:

---- The needle sealing portion 612 is formed by a **tool 100, such as, for example, a** grinding tool so as to provide a selected finish. **The selected finish can be less than 0.5 micrometers, preferably between 0.2 micrometers and 0.4 micrometers.** The contour of the needle sealing portion 612 can be described by the shape of each second transverse cross-sectional area and the rate that the second transverse cross-sectional area decreases throughout the needle sealing portion 612. The second transverse cross-sectional area can have a first area in the imaginary plane that is proximate to the upstream face 602, and decrease at a first rate to a second area in the imaginary plane that is distal from the upstream face 602. As discussed above, this rate may be constant or variable. In the case where the shape of each second transverse cross-sectional area is a circle having a diameter that ~~[deceases]~~ **decreases** at a constant rate, as is illustrated in Figure 2, the shape of the needle sealing portion 612 is that of a truncated right cone with an included angle 624. Of course, different shapes for the needle sealing portion 612 can be obtained by varying the shape of the second transverse cross-sectional areas or by varying the rate at which the second transverse cross-sectional areas change.--

Paragraph on page 8, starting on line 27 has been amended as follows:

-- The transition portion 614 can be formed by**, for example,** a grinding tool~~[,]~~ **or** a drill bit, etc. The contour of the transition portion 614 can be described by the shape of each third transverse cross-sectional area and the rate that the third transverse cross-sectional area decreases throughout the transition portion 614. The third transverse cross-sectional area can decrease at a second rate from the second area of the second transverse cross-sectional area to the first transverse cross-sectional area of the orifice portion 608. As discussed above, this rate may be constant or variable. In the case where the shape of each third transverse cross-sectional area is a circle having a diameter that ~~[deceases]~~ **decreases** at a constant rate, as is illustrated in Figure 2,

VERSION SHOWING MARKED UP CHANGES

the shape of the transition portion 614 is that of a truncated right cone with an included angle 626. Of course, different shapes for the transition portion 614 can be obtained by varying the shape of the second transverse cross-sectional areas or by varying the rate at which the second transverse cross-sectional areas change.--

IN THE CLAIMS:

Claims 1 and 5 have been canceled.

Claims 2, 6-8 have been amended as follows:

2. (Amended) The method according to claim ~~[1]~~ 7, wherein the sealing portion comprises a first conical section defining a first included angle, and the transition portion comprises a second conical section defining a second included angle, and wherein the first included angle is greater than the second included angle.

6. (Amended) The method according to claim ~~[5]~~ 7, wherein the grinding tool is driven in rotation about an axis of rotation.

7. (Amended) ~~[The method according to claim 6, wherein]~~ **A method of forming a fuel injector seat, the seat having an upstream face, a downstream face, and a passage extending along an axis between the upstream face and the downstream face, the method comprising:**

forming within the passage an orifice portion proximate the downstream face and having a first transverse cross-sectional area relative to the axis;

forming within the passage a sealing portion proximate the upstream face and having a second transverse cross-sectional area relative to the axis that decreases at a first rate in a downstream direction from a first area to a second area;

determining a ratio of the first transverse cross-sectional area over the first area; and

VERSION SHOWING MARKED UP CHANGES

forming within the passage a transition portion when the ratio of the first transverse cross-sectional area over the first area exceeds a predetermined value, the transition portion being interposed between the orifice portion and the sealing portion and having a third transverse cross-sectional area relative to the axis that decreases at a second rate in the downstream direction from the second area to the first transverse cross-sectional area, wherein the forming of the sealing portion includes grinding with a tool that has a conical end with a vertex of the conical end disposed in the transition portion to provide a select finish on the sealing portion, the transition portion provides a volume receiving ~~[an apex]~~ **the vertex** of the ~~[grinding]~~ tool, the ~~[apex]~~ **vertex** being proximate to the axis of rotation.

8. (Amended) The method according to claim ~~[5]~~ 7, wherein the select finish is less than 0.5 micrometers.

****